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EXAMINER	
TAYLOR, BARRY W	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/014,760	RICHTER ET AL.	
	Examiner	Art Unit	
	Barry W. Taylor	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 March 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-4 and 6-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4 and 6-49* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

1. Claims 1-2, 6-11, 15-19, 21-22, 25-26, 29-32, 34-35, 39, 41-42 and 46-49 are rejected under 35 U.S.C. 103(a) as being obvious over Bertonis et al (6,625,222 hereinafter Bertonis) in view of Rogers et al (6,681,103 hereinafter Rogers). The following rejected has been amended for clarity purposes only.

Regarding claim 1. Bertonis teaches a data channel tuner (title, abstract, figure 8) comprising:

an input interface for accepting said data channel, wherein said input interface further accepts signal energy at a frequency associated with an image of said data

channel as mixed by said tuner (see figure 8 wherein LNA generates signal plus noise before passing to an adaptive Image Reject Mixer 105. The Examiner notes that Bertonis figure 8 shows Band Pass Filter network (BPF) and such filters are well known in art. It is well known in the art that BPF may provide impedance matching as well as a desired frequency response.); and

an image reject mixer coupled to said input interface and providing frequency conversion of said data channel (see Adaptive Image Reject Mixer 105 figure 8).

According to Applicant, Bertonis does not teach "a filter network coupled to said input interface, wherein said filter network utilizes one or more low order filters" (see newly amended claim limitations in independent claim 1).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21) which can be made variable thereby enabling tuning of the resonant frequency (col. 5 lines 2-6). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

In summation, Applicants have clearly defined what is meant by first order and second order filters (see Applicants remark on page 9, paper dated 3/2/07) wherein

Applicants define first order and second order filters to mean LC filters. However, Rogers modifies the LNA shown in figures 1-2 to include a first order resonator circuit (see LC resonator in col. 3 lines 35-57). In other words, Rogers realizes that prior art approach to Image Rejection had to use "off-chip" passive filters which could not be integrated onto the chip (col. 1 lines 35-37). Roger teaches the desire to filter "PRIOR" to downconversion (i.e. at the LNA) to suppress the unwanted images (see col. 1 lines 32-34). Therefore, Rogers puts an LC resonator at the LNA so that the LNA does not amplify the image noise. Roger does not amplify the noise but instead uses LC resonator at the LNA to first reject the image noise then amplifies the signal thereby improving on performance of Image Rejection by first filtering out image noise before the LNA performs amplification.

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claims 2 and 49. Rogers does not require manual tuning because Roger provides the LNA with its own LC resonator so as to first filter image noise before the LNA amplifies the signal (col. 1 lines 33-60, col. 3 lines 35-57, col. 4 line 66 – col. 5 line 15).

Regarding claims 6-7. Bertonis does not use the term "first order" in his specification. The Examiner notes that Applicants have clearly defined what is meant by "first order" by pointing to paragraphs 0031-0032 (see paper dated 3/2/07, page 9) wherein first order means LC filter.

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (i.e. col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 8. Bertonis teaches at least one amplifier (see 81 figure 8) disposed in a signal path between a filter (99 figure 8) of said filter network and said image reject mixer (105 figure 8).

Regarding claims 9-10. Bertonis does show IC technology being employed.

Rogers also teaches a image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 11. Bertonis teaches that Image and desired signals are closely (i.e. 10%) spaced (col. 2 lines 5-8).

Regarding claim 15. Bertonis teaches data channel comprises a forward data channel and image frequency signal energy comprises a forward access terminal signal (see col. 4 lines 25-67 wherein standard cable modem used).

Regarding claim 16. Bertonis teaches digital data stream (see DOCSIS standards for cable modem---col. 2 line 64).

Regarding claim 17. Bertonis teaches a system for providing tuning of a particular signal in a signal data stream including additional signal energy at an image frequency of said particular signal as frequency converted by said system (title, abstract, see figure 8 wherein LNA generates signal plus noise before passing to an adaptive Image Reject Mixer 105), comprising:

an image reject mixer providing frequency conversion of said particular signal and rejection of said additional signal energy, wherein a signal energy of said particular signal is substantially less than said additional energy (see Adaptive Image Reject Mixer 105 figure 8 used to convert a particular signal and reject image (i.e. additional signal energy) wherein the signal of interest and image are closely spaced---col. 2 lines 5-8).

According to Applicant, Bertonis does not teach "a filter network" coupled to an image reject mixer (see newly amended claim 17).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21) which can be made variable thereby enabling tuning of the resonant frequency (col. 5 lines 2-6). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

In summation, Applicants have clearly defined what is meant by "a filter network" (see Applicants remark on page 9, paper dated 3/2/07) wherein Applicants define "a filter network" to be a LC filter. However, Rogers modifies the LNA shown in figures 1-2 to include a first order resonator circuit (see LC resonator in col. 3 lines 35-57). In other words, Rogers realizes that prior art approach to Image Rejection had to use "off-chip" passive filters which could not be integrated onto the chip (col. 1 lines 35-37). Roger teaches the desire to filter "PRIOR" to downconversion (i.e. at the LNA) to suppress the unwanted images (see col. 1 lines 32-34). Therefore, Rogers puts an LC resonator at the LNA so that the LNA does not amplify the image noise. Roger does not amplify the noise but instead uses LC resonator at the LNA to first reject the image noise then amplifies the signal thereby improving on performance of Image Rejection by first filtering out image noise before the LNA performs amplification.

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 18. Bertonis teaches that Image and desired signals are closely (i.e. 10%) spaced (col. 2 lines 5-8).

Regarding claim 19. Bertonis does not use the term "first order" in his specification. The Examiner also notes that Applicants have clearly defined "first order" to mean LC filter (see paper dated 3/2/07, page 9).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 21. Rogers does not require manual tuning because Roger provides the LNA with its own LC resonator so as to first filter image noise before the LNA amplifies the signal (col. 1 lines 33-60, col. 3 lines 35-57, col. 4 line 66 – col. 5 line 15).

Regarding claims 22 and 25. Bertonis does show IC technology being employed.

Rogers also teaches a image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 26. Bertonis teaches data channel comprises a forward data channel and image frequency signal energy comprises a forward access terminal signal (see col. 4 lines 25-67 wherein standard cable modem used).

Regarding claim 29. Bertonis teaches a data channel tuner for tuning a particular signal from a signal stream (title, abstract, figure 8) comprising:

Providing the signal stream having a first signal and a second signal ... (see figure 8 wherein LNA generates signal plus noise before passing to an adaptive Image Reject Mixer 105); and

Mixing the signal stream using an image reject mixer ... (see Adaptive Image Reject Mixer 105 figure 8).

According to Applicant, Bertonis does not teach "one or more filters comprise only first order filters, second order filters, or a combination thereof" (see newly amended claim limitations in independent claim 29).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21) which can be made variable thereby enabling tuning of the resonant frequency (col. 5 lines 2-6). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

In summation, Applicants have clearly defined what is meant by first order and second order filters (see Applicants remark on page 9, paper dated 3/2/07) wherein Applicants define first order and second order filters to mean LC filters. However, Rogers modifies the LNA shown in figures 1-2 to include a first order resonator circuit (see LC resonator in col. 3 lines 35-57). In other words, Rogers realizes that prior art approach to Image Rejection had to use "off-chip" passive filters which could not be integrated onto the chip (col. 1 lines 35-37). Roger teaches the desire to filter "PRIOR"

to downconversion (i.e. at the LNA) to suppress the unwanted images (see col. 1 lines 32-34). Therefore, Rogers puts an LC resonator at the LNA so that the LNA does not amplify the image noise. Roger does not amplify the noise but instead uses LC resonator at the LNA to first reject the image noise then amplifies the signal thereby improving on performance of Image Rejection by first filtering out image noise before the LNA performs amplification.

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 30. Bertonis teaches data channel comprises a forward data channel and image frequency signal energy comprises a forward access terminal signal (see col. 4 lines 25-67 wherein standard cable modem used).

Regarding claims 31-32. Bertonis does not use the term "first order" in his specification. Applicants have clearly defined "first order" or "second order" to mean LC filters (see paper dated 3/2/07, page 9).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip

image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Method claim 34 is rejected for the same reasons as apparatus claim 1 and system claim 17 since the recited apparatus and system would perform the claimed method steps. Furthermore, Rogers does not require manual tuning because Rogers provides an LC resonator in the LNA (col. 1 lines 33-60, col. 3 lines 35-57, col. 4 line 66 – col. 5 line 15).

Regarding claim 35. Bertonis does not use the term "first order" in his specification. Applicants have clearly defined what is meant by "first order" (see paper dated 3/2/07 page 9 wherein first order means LC filter).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC

components (col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Method claim 39 is rejected for the same reasons as apparatus claim 1 and system claim 17 since the recited apparatus and system would perform the claimed method steps. Furthermore, Applicants have defined "one or more filters" to mean LC filters (see paper dated 3/2/07, page 9).

Regarding claim 41. Bertonis does not use the term "first order" in his specification. Applicants have defined "first order" and "second order" to mean LC filters (see paper dated 3/2/07 page 9).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip

image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 42. Bertonis teaches that Image and desired signals are closely (i.e. 10%) spaced (col. 2 lines 5-8).

Method claim 46 is rejected for the same reasons as apparatus claim 1 and system claim 17 since the recited apparatus and system would perform the claimed method steps. Furthermore, Rogers does not require manual tuning because Rogers provides an LC resonator in the LNA.

Regarding claim 47. Bertonis does not use the term "first order" in his specification. Applicants have defined first order to mean LC filter (see paper dated 3/2/07, page 9).

Rogers also teaches an image reject filter (figure 1) having a filter network (see FILTER figure 1) coupled to said image reject mixer (see MIXER figure 1). Rogers

improves on prior art (see figure 1) by using on-chip image rejection filter having LC components (col. 1 line 5 – col. 2 line 21). Rogers discloses that by using on-chip image filter to provide selective amplification of a signal at a desired frequency, to enable tuning of the resonant frequency, and to eliminate noise owing to the frequency selectivity of the tuned circuit (see figures 1-4, col. 3 lines 33-67, col. 4 line 66 – col. 5 line 33).

It would have been obvious for any one of ordinary skill in the art at the time of the invention to replace the LNA as taught by Bertonis (see item 81 in figure 8 of Bertonis) with the LNA having an LC resonator as taught by Rogers in order to further enhance Image rejection by first filtering out the noise image before the LNA amplifies the signal.

Regarding claim 48. Bertonis teaches that Image and desired signals are closely (i.e. 10%) spaced (col. 2 lines 5-8).

2. Claims 3-4, 12-14, 20, 23-24, 27-28, 33, 36-38, 40, 43-45 are rejected under 35 U.S.C. 103(a) as being obvious over Bertonis et al (6,625,222 hereinafter Bertonis) in view of Rogers et al (6,681,103 hereinafter Rogers) further in view of Applicants own admittance or Cheah (6,674,409). The following rejections are being made as best understood by the Examiner due to the 35 U.S.C. 112, first paragraph rejections listed above.

Regarding claims 3-4, 23-24, 33, 36-38, 40 and 44-45. Bertonis in view of Rogers does not show using 20 dB.

However, Applicants openly admit that FCC standards have been set for signal to noise and distortion radio when operating in the MHz channel spacing (see 20 dB in paragraph 0006 of Applicants current invention or column 3 lines 31-40 in Cheah).

It would have been obvious for any one of ordinary skill in the art at the time of invention to utilize standards that have already been established as evident by Applicants own admittance.

Regarding claims 12-14, 27-28 and 43. Bertonis in view of Rogers does not list approximate frequencies.

However, Applicants openly admit that FCC standards have been set for signal to noise and distortion radio when operating in the MHz channel spacing (see 20 dB in paragraph 0006 of Applicants current invention or column 3 lines 31-40 in Cheah). Applicants openly admit that tuners (see figure 1 and paragraph 0022 of Applicants disclosure) already operate in frequency ranges of approximate 70 MHz to 130 MHz and other frequencies close to tuner (see 142 MHz in paragraph 0022 of Applicants specification).

It would have been obvious for any one of ordinary skill in the art at the time of invention to utilize standards that have already been established as evident by Applicants own admittance.

Regarding claim 20. Bertonis in view of Rogers fail to show using 20 dB.

However, Applicants openly admit that FCC standards have been set for signal to noise and distortion radio when operating in the MHz channel spacing (see 20 dB in paragraph 0006 of Applicants current invention or column 3 lines 31-40 in Cheah).

It would have been obvious for any one of ordinary skill in the art at the time of invention to utilize standards that have already been established as evident by Applicants own admittance.

Response to Arguments

3. Applicant's arguments filed 3/2/07 have been fully considered but they are not persuasive.

a) Applicants have clearly defined what is meant by "first order" and "second order" (see page 9, paper dated 3/2/07 wherein Applicants point to paragraph 0031 and the Examiner notes that paragraph 0031 defines "first order" or "second order" as basic LC filters.

b) Applicants generally argue that there is no motivation to combine (see paper dated 3/2/07, pages 14-17).

The Examiner respectfully disagrees. First of all, Bertonis teaches image reject mixer having its own low-pas filter (i.e. LC filter). In other words, Bertonis teaches filtering at the image reject mixer but not before because Bertonis shows LNA (item 81) feeding the image reject mixer. Therefore, what is missing from Bertonis figure 8 is filtering before the image reject mixer (item 105 figure 8).

Second the Examiner notes that applicants have clearly defined what is meant by first order and second order filters (see Applicants remark on page 9, paper dated 3/2/07) wherein Applicants define first order and second order filters to mean basic LC filters.

Third, Rogers modifies the LNA to include a resonator circuit (see LC resonator in col. 3 lines 35-57). In other words, Rogers realizes that prior art approach to Image Rejection had to use "off-chip" passive filters which could not be integrated onto the chip (col. 1 lines 35-37). Roger teaches the desire to filter "PRIOR" to downconversion (i.e. at the LNA) to suppress the unwanted images (see col. 1 lines 32-34). Therefore, Rogers puts an LC resonator at the LNA so that the LNA does not amplify the image noise. Roger does not amplify the noise but instead uses LC resonator at the LNA to first reject the image noise then amplifies the signal thereby improving on performance of Image Rejection by first filtering out image noise before the LNA performs amplification thereby providing for a cleaner signal at the LNA output. Realizing that both Bertonis and Roger teach image rejection and Bertonis shows filter at the image reject mixer stage and Rogers wants to filter prior to the LNA by placing LC resonator at the LNA will cause unwanted image noise to be filtered out before the LNA amplifies the signal. One of ordinary skill in the are would readily recognize the benefit of replacing the LNA as taught by Bertonis figure 8 with that as taught by Rogers because doing so would only lead to an enhanced image reject mixer because a cleaner signal would be provided to Bertonis image reject mixer.

c) Applicants generally argue that Bertonis and Rogers does not teach filters that do not require manual training and generally point to Rogers at col. 5 lines 42-48 (see Applicants remarks on page 18, paper dated 3/2/07).

The Examiner notes that Rogers does not require manual tuning. Instead, Rogers provides the an LC resonator at the LNA. Rogers discloses that using "off-chip"

passive filters leads to great expanse at the manufacturing level because the "off-chip" components would have to be manually tuned to additional pins on the Integrated Circuit (col. 1 lines 33-60). Most importantly, Rogers discloses that the LC resonator could be made variable to enable tuning of the resonant frequency (col. 4 line 66 – col. 5 line 6). Furthermore, Rogers never mentions "manual" tuning but instead uses electrical tuning because the LC resonator is integrated into the LNA.

d) Applicants generally start repeating the arguments listed in sections a-c listed above (see Applicants arguments starting on page 19 and continuing to page 24, paper dated 3/2/07. See sections a-c listed above.

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

---(6,377,315) Carr et al is considered pertinent for putting LC circuits on a TV tuner (abstract). Carr et al is very clear in that both manual and electrical tuning by using LC circuit on TV tuner (see figure 24a, col. 16 lines 12-60, see col. 32 lines 34-35 wherein no-manual tuning required because an LC filter does not need to be manually switched but instead is electronically switched, col. 33 lines 28-40 reveal that a manual means may be provided thereby allowing for LC circuit to be slightly adjusted up or down, col. 51 line 50 – col 52 line 4, col. 53 lines 47-55, col. 55 lines 25-67, col. 56 lines 1-41, reveal that LC filters are integrated onto chip to attenuate out-of-band signals..

---(7,050,778) Olson is considered pertinent for teaching TV tuners on a single chip solution (abstract) to reduce or eliminate component adjustment during manufacturing (i.e. manual tuning --- col. 1 lines 60-63). In other words, Olson replaces off-chip SAW filters (col. 7 lines 32-34) by integrating a "pre-select" filter onto the chip (see Low-pass filter item 802 figure 8 used to replace off-chip SAW filters).

---(2003/0206065) Gomez also discloses that it is extremely common in TV turners to use LC circuit to provide fine and coarse tuning (abstract, paragraph 0007).

---(6,249,194) Watanabe et al is considered pertinent for integrating a SAW filter and an LC filter so the number of parts can be reduced and the assembly process can be made easy (abstract, col. 2 lines 6-11).

4. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry W. Taylor, telephone number (571) 272-7509, who is available Monday-Thursday, 6:30am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, William Trost, can be reached at (571) 272-7872. The central facsimile phone number for this group is **571-273-8300**.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2600 receptionist whose telephone number is (571) 272-2600, the 2600 Customer Service telephone number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Centralized Delivery Policy: For patent related correspondence, hand carry deliveries must be made to the Customer Service Window (now located at the Randolph Building, 401 Dulany Street, Alexandria, VA 22314), and facsimile transmissions must be sent to the central fax number (**571-273-8300**).

Barry W. Taylor
Art Unit 2617

Barry Taylor 5/7/07

BARRY TAYLOR
PRIMARY EXAMINER